

CLAIMS

I claim:

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1. An event annunciator comprising:

a sound generating component;

an indicator light interface circuit coupled to an indicator light of a security system to sense ON and OFF states of the indicator light and provide a first signal responsive to the states  
10 of the indicator light; and

a processing component coupled to the interface circuit and to the sound generating component to receive the first signal and cause the sound generating component to generate speech announcements in response to flashing sequences of ON and OFF states of the indicator light.

15 2. An event annunciator according to claim 1, further comprising a memory storing program code, wherein the processing component comprises a digital processor capable of executing the code, the digital processor being capable of receiving the first signal and generating the speech announcements under control of the code.

3. An event annunciator according to claim 2, wherein the indicator light interface circuit  
20 comprises a comparator capable of performing comparisons between a second signal from the security system and a predetermined level, and generating the first signal based on the comparisons.

4. An event annunciator according to claim 2, wherein the indicator light interface circuit comprises an optoelectronic component optically coupled to the indicator light to sense the states of the indicator light and generate the first signal in response to the states of the indicator light.

5. An event annunciator according to claim 2, wherein the processing component suppresses  
5 a first speech announcement that follows a second speech announcement within a first predetermined time period if the first speech announcement is identical to the second speech announcement.

6. An event annunciator according to claim 2, further comprising an digital-to-analog converter (DAC) coupled between the processing component and the sound generating  
10 component, wherein the processing component is capable of sending speech segments to the DAC to cause the DAC to drive the sound generating component with electronic audio signals corresponding to the speech announcements.

7. An event annunciator according to claim 2, wherein the memory further stores sets of attributes of flashing sequences, each set of attributes being associated with a sample flashing  
15 sequence and a security system event.

8. An event annunciator according to claim 7, wherein the digital processor is capable, under control of the code, of delimiting the flashing sequences of ON and OFF states of the indicator light and comparing attributes of each delimited sequence to one or more of the sets of attributes stored in the memory to identify a set of attributes matching the attributes of said each  
20 delimited sequence.

9. An event annunciator according to claim 8, wherein:

the memory further stores speech synthesis segments comprising audio data capable of being reproduced as the speech announcements, said each set of attributes being associated with at least one of the speech synthesis segments; and

the digital processor is capable, under control of the code, of reproducing the audio data of said at least one of the speech synthesis segments when the processor identifies a delimited segment with attributes matching said each set of attributes.

10. An event annunciator according to claim 9, wherein:

the memory stores the speech synthesis segments in compressed form; and

the processor, under control of the code, uncompresses said each segment before reproducing the audio data of said each segment.

11. An event annunciator according to claim 9, further comprising an digital-to-analog converter (DAC) coupled between the processor and the sound generating component, wherein the processor, under control of the code, reproduces the audio data of said each segment using the DAC to drive the sound generating component.

12. An event annunciator according to claim 9, wherein the memory comprises a non-volatile memory device storing the program code, and a volatile memory device used by the processor to store computational results.

13. An event annunciator according to claim 2, further comprising means for learning sets of attributes of the flashing sequences and the announcements corresponding to the sets of attributes.

14. An event annunciator according to claim 9, further comprising a microphone coupled to the processor so as to allow the processor to sample microphone signals generated by the microphone in response to sounds, and a manual input device coupled to the processor to allow the processor to sense the state of the manual input device.

5 15. An event annunciator according to claim 14, wherein the processor is capable of:

prompting a user of the annunciator to cause the security system to generate at least one sample flashing sequence;

storing a first set of attributes of the at least one sample flashing sequence in the memory;

prompting the user to speak a first announcement into the microphone;

10 storing in the memory a first speech synthesis segment derived from microphone signals generated when the user speaks the first announcement into the microphone; and

reproducing the first announcement in response to receiving from the indicator light a flashing sequence with attributes matching the first set of attributes.

16. An event annunciator according to claim 14, further comprising a communication port,

15 wherein the processor is capable of:

prompting a user of the annunciator to cause the security system to generate at least one sample flashing sequence;

storing a first set of attributes of the at least one sample flashing sequence in the memory;

prompting the user to input a first speech synthesis segment into the communication port,

20 the first speech synthesis segment corresponding to a first announcement;

storing in the memory the first speech synthesis segment; and

reproducing the first announcement in response to receiving from the indicator light a flashing sequence with attributes matching the first set of attributes.

17. A security system event annunciator comprising:

a speaker;

a sensing circuit coupled to an indicator light of a security system to generate a first signal with first and second states, each state of the first signal corresponding to a different state of the indicator light;

a processor under control of program code, the processor being coupled to the speaker and to the sensing circuit to

delimit sequences of the first and second states of the first signal,

select speech synthesis segments based on attributes of the delimited sequences,

and

cause the speaker to generate speech announcements corresponding to the attributes of the delimited sequences.

18. A security system event annunciator according to claim 17, further comprising a digital-to-analog converter (DAC) coupled between the processor and the speaker, wherein the processor sends data to the DAC to cause the DAC to drive the speaker to generate the announcements.

19. A security system event annunciator according to claim 18, wherein the processor uncompresses the data before sending the data to the DAC.

20. A security system annunciator according to claim 17, further comprising a microphone coupled to the processor so that the processor is capable of sensing microphone signals generated by the microphone in response to sound, wherein the processor is capable of obtaining speech synthesis segment data corresponding to the announcements by prompting a user of the security

system to cause the security system to generate flashing of the indicator light, prompting the user to speak the announcements into the microphone, and recording the microphone signals generated in response to the user speaking the announcements.

21. A security system annunciator according to claim 17, further comprising means for  
5 learning sets of the attributes and the announcements corresponding to the sets of the attributes.

22. A method of converting event indications generated by an indicator light of a security system into speech announcements, the method comprising:

sensing states of the indicator light;

generating a first signal with a plurality of states, current state of the first signal being

10 responsive to the states of the indicator light;

delimiting sequences of the states of the first signal;

determining attributes of the delimited sequences;

comparing attributes of each delimited sequence to sets of stored attributes to match  
attributes of said each delimited sequence to one of the sets of stored attributes;

15 retrieving speech synthesis segment data corresponding to said one of the sets; and

using the speech synthesis segment data to generate an audible speech announcement.

23. A method according to claim 22, wherein the step of using the data comprises sending the data to a digital-to-analog converter (DAC) to cause the DAC to drive a speaker with an electronic audio signal corresponding to the audible speech announcement.

20 24. A method according to claim 22, further comprising uncompressing the data before the step of using the data to generate an audible speech announcement.

25. A method according to claim 24, wherein the step of using the data comprises sending the uncompressed data to a digital-to-analog converter (DAC) to cause the DAC to drive a speaker with an electronic audio signal corresponding to the audible speech announcement.

26. A method according to claim 22, further comprising:

5       prompting a user of the security system to cause the security system to flash the indicator light in response to an event;

          delimiting a first sequence of the states of the first signal, the first sequence being caused by the user causing the security system to flash the indicator light in response to the event;

          storing a first set of attributes of the first sequence;

10       prompting the user to speak a first announcement corresponding to the event; and

          recording the user speaking the first announcement as first speech synthesis segment data;

          wherein:

          the step of retrieving comprises retrieving the first speech synthesis segment data when  
15       attributes of said each delimited sequence match the first set of attributes; and

          the step of using comprises using the first speech synthesis segment data to generate the first announcement.

27. A method according to claim 22, further comprising step for storing the sets of attributes and recording the speech synthesis segment data corresponding to the sets of attributes.